

Affordable Maximum Performance Solar Array for NASA and Commercial Missions, Phase II Project

SBIR/STTR Programs | Space Technology Mission Directorate (STMD)



ABSTRACT

Deployable Space Systems, Inc. (DSS), and Space Systems Loral as a key subcontractor and potential commercial infusion partner, will focus the proposed SBIR Phase 2 program on the TRL 5/6 technology maturation / development of an affordable, lightweight, high power, maximum performance solar array specifically configured to next-generation high power geostationary-earth-orbit commercial mission requirements, and in support of future NASA missions. DSS's recently completed NASA SBIR Phase 1 program has established a TRL 3/4 classification for an innovative affordable maximum performance solar array as applied to a multitude of NASA and commercial missions. Significant concept feasibility, design/analysis, trade study/evaluation, and proof-of-concept hardware build/test efforts executed during the Phase 1 program have validated the proposed technology as a potentially revolutionary photovoltaic flexible blanket solar array system that provides enabling performance in terms of: High specific power / lightweight (up to 200 W/kg BOL at the array level with ZTJ PV), compact stowage volume (>60-80 kW/m³ BOL), high deployed strength and stiffness, mechanical and electrical simplicity, high reliability, high modularity, rapid production capability, high platform flexibility and applicability to many missions, and ultra-affordability (>24% recurring cost savings at a minimum). Building off the success of the recently completed Phase 1 program, the proposed Phase 2 follow-on program will significantly increase technology readiness to TRL 5/6, ready it for an end-user qualification program, and drastically accelerate commercial infusion.

ANTICIPATED BENEFITS

To NASA funded missions:

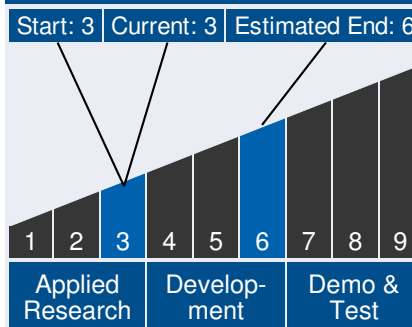
Potential NASA Commercial Applications: NASA space applications are comprised of practically all Space Science, Earth Science, Exploration, Planetary and Lunar Surface, and



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Technology Maturity



Management Team

Program Executives:

- Joseph Grant
- Laguduva Kubendran

Program Manager:

- Carlos Torrez

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other missions that require affordable and high performance photovoltaic power production through solar arrays. The technology is particularly suited for missions that require game-changing performance in terms of affordability, ultra-lightweight, and compact stowage volume. The proposed technology will enable ultra-high power solar arrays for future Exploration missions through lightweight, compact stowage, and significant affordability.

To the commercial space industry:

Potential Non-NASA Commercial Applications: Non-NASA space applications are comprised of practically all missions that require high-efficiency photovoltaic power production through deployment of an ultra-lightweight and highly-modular solar array system. The technology is particularly suited for missions that require game-changing performance in terms of affordability, ultra-lightweight, and compact stowage volume. The proposed technology will enable ultra-high power solar arrays for future missions through lightweight, compact stowage, and significant affordability. Applicable non-NASA space missions include: LEO surveillance, reconnaissance, communications and other critical payload/equipment satellites, LEO commercial mapping and critical payload/equipment satellites, MEO satellites & space-tugs, GEO commercial communications and critical payload/equipment satellites, and GEO communications and payload/equipment satellites. The proposed technology also has tremendous dual-use non-space commercial private-sector applicability including fixed-ground and deployable/retractable mobile-ground based systems.

Management Team (cont.)

Project Managers:

- Elwood Agasid
- Anna maria Pal

Principal Investigator:

- Brian Spence

Technology Areas

Primary Technology Area:

Materials, Structures, Mechanical Systems and Manufacturing (TA 12)

- └ Structures (TA 12.2)
 - └ Lightweight Concepts (TA 12.2.1)
 - └ Very Large Solar Array Structure (TA 12.2.1.4)

Additional Technology Areas:

Space Power and Energy Storage (TA 3)

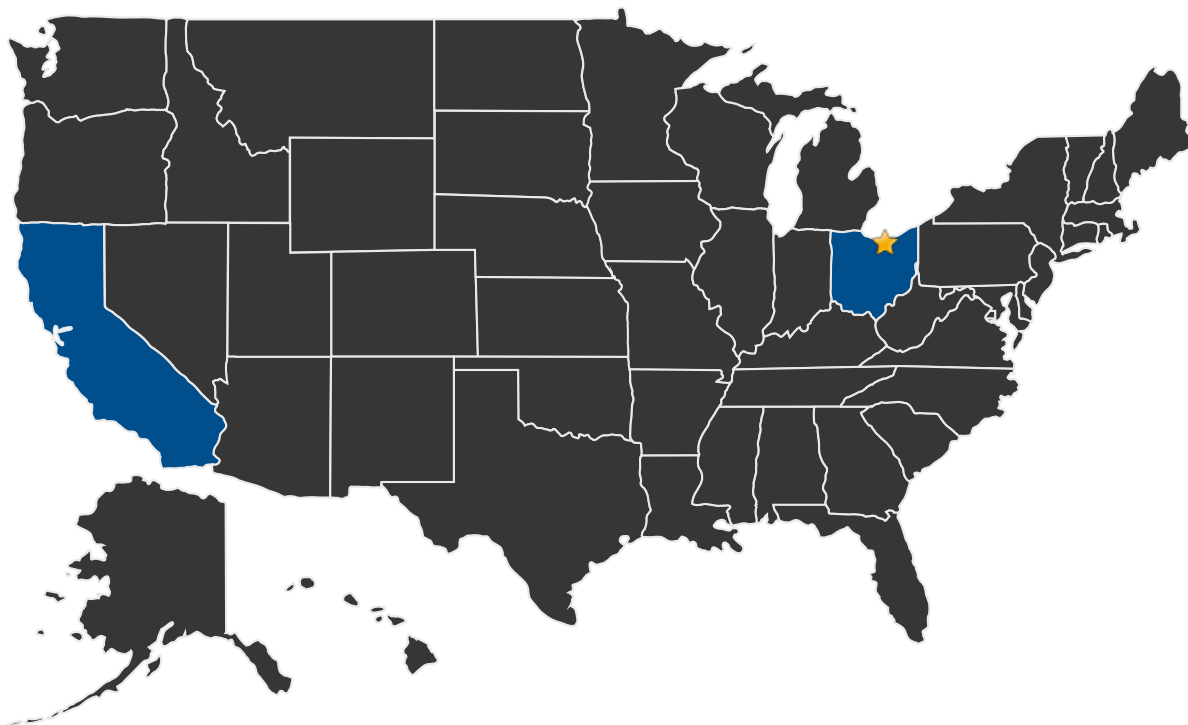
- └ Power Generation (TA 3.1)
 - └ Solar (TA 3.1.3)

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U.S. WORK LOCATIONS AND KEY PARTNERS



■ U.S. States With Work ★ **Lead Center:**
Glenn Research Center

Other Organizations Performing Work:

- Deployable Space Systems, Inc. (Goleta, CA)

PROJECT LIBRARY

Presentations

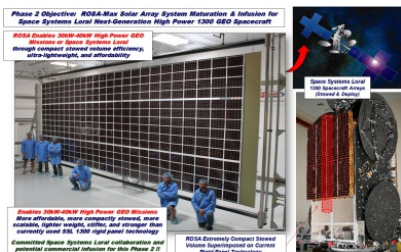
- Briefing Chart
 - (<http://techport.nasa.gov:80/file/22930>)

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IMAGE GALLERY



*Affordable Maximum Performance
Solar Array for NASA and Commercial
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DETAILS FOR TECHNOLOGY 1

Technology Title

Affordable Maximum Performance Solar Array for NASA and Commercial Missions

Potential Applications

NASA space applications are comprised of practically all Space Science, Earth Science, Exploration, Planetary and Lunar Surface, and other missions that require affordable and high performance photovoltaic power production through solar arrays. The technology is particularly suited for missions that require game-changing performance in terms of affordability, ultra-lightweight, and compact stowage volume. The proposed technology will enable ultra-high power solar arrays for future Exploration missions through lightweight, compact stowage, and significant affordability.